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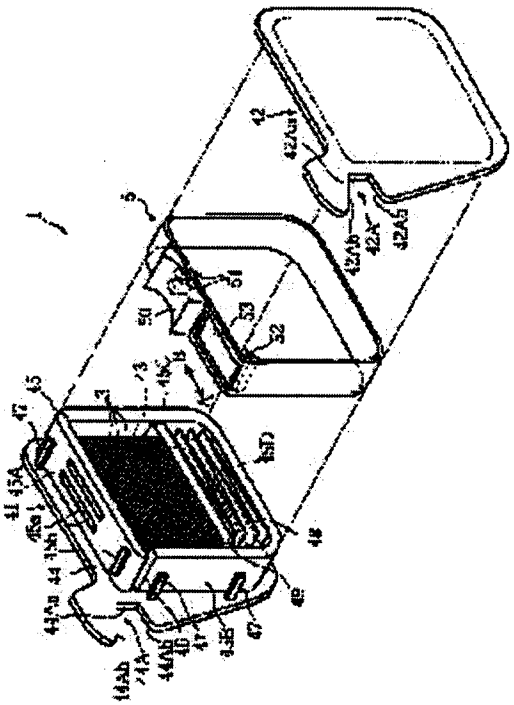
(54) ANALYZER SET AND ANALYZING TOOL CARTRIDGE WITH MECHANISM OF TAKING OUT

(57)Abstract:
PROBLEM TO BE SOLVED: To easily mount an analyzing tool on an analyzer.
SOLUTION: In an analyzing cartridge being composed of a case 4 which has a containing space 43 and a taking out opening 46, and composed of multiple analyzing tools 3 which are contained so as to be laminated in the containing space 43, a taking out mechanism for taking out the analyzing tool 3 one by one from the case 4 through the taking out opening 46 is provided additionally. Furthermore, an opening/closing mechanism which opens and closes the taking out opening 46 and is composed of an operating body 5 together with the taking out mechanism, is provided preferably. The operating body 5 has an engaging projective section 51, which, for example, makes the analyzing tools 3 move integrally, a closing section 52 which closes the taking out opening 46, and an opening section 53 which opens the taking out opening 46.



[Detailed Description of the Invention]

[0001]

[Field of the Invention]the analysis apparatus constituted so that the specific component in the sample solution which the invention in this application equipped with and used the sensor cartridge and analysis tools which accommodated two or more analysis tools, and was supplied to these analysis tools might be analyzed -- and -- It is related with the set of a sensor cartridge and an analysis apparatus.

[0002]

[Description of the Prior Art]There are some which used the oxidation-reduction reaction which made redox enzyme the catalyst as a general method of measuring the concentration of the specific component in body fluid, for example, glucose in blood. A simple blood sugar level measuring device (an example of an analysis apparatus) of size which is settled in a palm is used widely so that the blood sugar level can be simply measured at a house, a destination, etc. on the other hand. In this simple blood sugar level measuring device, while providing the enzyme reaction place, after equipping with the biosensor (an example of analysis tools) constituted as throwing away, measurement of the blood sugar level is performed by supplying blood to this biosensor.

[0003]

[Problem(s) to be Solved by the Invention]As shown in drawing 11, a user has the biosensor 91 in a hand and wearing of the biosensor 91 to the simple blood sugar level measuring device 90 is usually performed by inserting it in the loading slot 92 of the simple blood sugar level measuring device 90. There was fault which is explained below in such a mounting method of the biosensor 91.

[0004]The biosensor 91 is marketed in the state where it was individually accommodated in the packed body which laminated the aluminium sheet etc., for example. In this case, in order to equip the simple blood sugar level measuring device 90 with the biosensor 91, it is necessary to take out the biosensor 91 from a packed body first. Whenever such work tends to measure the blood sugar level, it is necessary to perform it, and it is troublesome, and inconvenient to people and the senior in whom eyesight declined especially.

[0005]As for the loading slot 92 of the simple blood sugar level measuring device 90, the biosensor 91 has a size corresponding to the section of the biosensor 91 in the opening part, while a width dimension is chip shape with a linear dimension of about 2-5 cm in about 0.5-1 cm. Therefore, the work which inserts the biosensor 91 to the loading slot 92 is not necessarily easy, and is inconvenient to people and the senior in whom especially eyesight declined.

[0006]The invention in this application is invented by the basis of such a situation, and makes it the technical problem to enable it to equip with analysis tools by easy operation to the analysis apparatus.

[0007]
[Description of the Invention]In the invention in this application, the following technical means are provided that the above-mentioned technical problem should be solved.
[0008]Namely, the analysis tools cartridge provided by the 1st side of the invention in this application, The case where it has output port which opens between receiving space, and this receiving space and outer space for free passage, It is the analysis tools cartridge provided with two or more analysis tools accommodated by the laminating condition in the above-mentioned receiving space, and is characterized by having further the tripper style for picking out the one above-mentioned analysis tools at a time from the above-mentioned case via the above-mentioned output port.
[0009]As for an analysis tools cartridge, it is preferred to have further the opening-and-closing mechanism for opening and closing output port that invasion of the dust through output port or moisture should be controlled. One operation body can constitute a tripper style and the above-mentioned opening-and-closing mechanism. In this case, the engagement heights for carrying out the 1 body motion of the analysis tools, when an operation body moves this operation body to a specific direction from a waiting state, It is constituted as a thing provided with the occlusion part which blockades output port in a waiting state, and the opening which opens output port when moving an operation body to a specific direction from a waiting state. As for an operation body, it is preferred to have a final controlling element for closing movement of this operation body further, if easy.
[0010]A case has the annular wall in which output port was provided while specifying receiving space, for example. In this case, an operation body is formed in looped shape, is arranged along the outside surface of an annular wall, and is constituted relatively movably to an annular wall.
[0011]As for analysis tools, it is preferred to have an engagement part with which engagement heights engage. This engagement part is constituted by the crevice or heights provided in analysis tools. When analysis tools are what has a capillary, the air vent port which is open for free passage to this capillary may be used as an engagement part.
[0012]It is preferred to accommodate a drier in the receiving space of a case. Then, it is controlled that the inside of receiving space is dehumidified and analysis tools deteriorate with humidity. Especially the thing for which the inside of receiving space is dehumidified in the analysis tools which have the reagent layer which the enzyme etc. contained is preferred. Two or more analysis tools are accommodated in receiving space, after having been supported by the mounting base, for example, but a drier is fixed to a mounting base in this case. Immobilization of a drier is performed kneading a granular drier with a resin material, for example, and distributing a drier in resin, or by making drier powder adhere to the surface of a mounting base.

[0013]As mentioned above, although an operation body is ******(ed) to a case, in order to guide an operation body at the time of this movement, it is preferred [an operation body] to provide a guide part to a case. A guide part is constituted as the slot established, for example in the case, or a projection.

[0014]In receiving space, it is more preferred than two or more analysis tools to laminate the information output chip in which an output of the information about the characteristic of analysis tools is possible as the upper layer, for example. As information outputted from an information output chip, the information (information required to choose an analytical curve in an analysis apparatus) about the sensitivity of analysis tools, the individual information (a manufacturing date, the expiration date, a manufacturing company, a factory place (country of manufacture and plant), etc.) of analysis tools, etc. are mentioned, for example.

[0015]If the information output chip is accommodated in receiving space so that it may become the topmost part, an information output chip will be taken out from an analysis tools cartridge by the beginning. Therefore, in using the analysis tools cartridge concerned, the information about the characteristic of analysis tools can be made to recognize to an analysis apparatus first. For example, when it is the information which needs the information from an information output chip for selection of an analytical curve, a possibility of neglecting selection of an analytical curve is reduced. In the selection method of such an analytical curve, since it is not necessary to perform troublesome operation in which a user performs button grabbing to an analysis apparatus etc., the burden of the user who is in charge of selection of an analytical curve can be reduced.

[0016]The analysis tools cartridge which starts the 1st side of the invention in this application mentioned above in the 2nd side of the invention in this application, An analysis apparatus constituted so that the specific component in the sample solution which equipped with the analysis tools taken out from this analysis tools cartridge, and was supplied to these analysis tools might be analyzed, It is a ** set and the above-mentioned analysis tools cartridge and the above-mentioned analysis apparatus are provided with the set of an analysis tools cartridge and an analysis apparatus, wherein the cartridge fixing means for carrying out the positioning fix of the above-mentioned analysis tools cartridge to the above-mentioned analysis apparatus is established.

[0017]The cartridge fixing means is provided with the notch provided, for example in the case, and the crevice established in the analysis apparatus.

[0018]The analysis tools cartridge which starts the 1st side of the invention in this application mentioned above in the 3rd side of the invention in this application, An analysis apparatus constituted so that the specific component in the sample solution which equipped with the analysis tools taken out from this analysis tools cartridge, and was supplied to these analysis tools might be analyzed, Are a ** set, and the above-mentioned analysis apparatus is provided

with the insert portion in which the end of the above-mentioned analysis tools is inserted, and for the above-mentioned analysis tools cartridge and the above-mentioned insert portion. The set of an analysis tools cartridge and an analysis apparatus, wherein the analysis tools fixing means for fixing the above-mentioned analysis tools to the above-mentioned analysis apparatus is established is provided.

[0019]It has the analysis tools fixing means with the crevice which is established in the heights provided, for example in either analysis tools or the insert portions, and another side of them, and engages with heights.

[0020]

[Embodiment of the Invention]Hereafter, the desirable embodiment of the invention in this application is concretely described with reference to drawings. The set of the sensor cartridge 1 and the analysis apparatus 2 concerning the invention in this application was shown in drawing 1.

[0021]The sensor cartridge 1 holds two or more biosensors 3, as shown in drawing 2, and it is constituted so that it can take out the one biosensor 3 at a time. This sensor cartridge 1 is provided with the operation belt 5 which carries out ****** (rotational motion) to the case 4 and this case 4 as shown in drawing 1 and drawing 2.

[0022]The case 4 has the 1st and 2nd members 41 and 42 formed by resin molding, for example, and the receiving space 43 for accommodating two or more biosensors 3 is formed by joining these.

[0023]The part I material 41 has the plate-like part 44 and the annular wall 45. The notch 44A is formed in the plate-like part 44. On the other hand, the 2nd member 42 has the same gestalt as the plate-like part 44 of the 1st member 41. That is, the 2nd member 42 also has the notch 42A. Each notches 42A and 44A have the shape extended as it has bottom surface 42Aa, 44Aa and two tapered surface 42Ab, and 44Ab and went to the method of outside. When these notches 42A and 44A equip the analysis apparatus 2 with the biosensor 3 taken out from the sensor cartridge 1 so that it may mention later with reference to drawing 6 and drawing 7, they are used in order to carry out the positioning fix of the sensor cartridge 1 to the analysis apparatus 2.

[0024]The annular wall 45 of the part I material 41 has the upper wall part 45A, the side wall parts 45B and 45C, and the bottom wall part 45D which project in the thickness direction of this plate-like part 44 from the edge part of the plate-like part 44. The notch 46 is formed between the upper wall part 45A and the side wall part 45B. This notch 46 is for taking it out outside, when the biosensor 3 which is open for free passage and is located in the topmost part with the receiving space 43 and the exterior moves in the direction of arrow B in a figure. Two or more projections 47 are formed around the annular wall 45. When the operation belt 5 carries out rotational motion of these projections 47, they have a function which guides it. Two or more

projections 47 may be formed in the 2nd member, and may attain such a guide function by establishing a slot in the 1st or 2nd member 41 and 42.

[0025]The two slits 45a and the stopper part 45b are formed in the upper wall part 45A. The slit 45a has penetrated the upper wall part 45A while being prolonged in the arrow AB direction in a figure. The locking claw 51 of the operation belt 5 mentioned later is inserted in this slit 45a, and it is permitted that this locking claw 51 moves in the arrow AB direction. The stopper part 45b is prolonged in the thickness direction of the plate-like part 44, and regulates movement of the operation belt 5.

[0026]In the receiving space 43, the mounting base 49 supported by the spring 48 fixed to the bottom wall part 45D is accommodated. This mounting base 49 is energized by the spring 48 towards the upper wall part 45A side. Between the mounting base 49 and the upper wall part 45A, two or more biosensors 3 are pinched by the resiliency of the spring 48 by the laminating condition. Thereby, two or more biosensors 3 are held in the receiving space 43 and by extension, the case 4.

[0027]The amendment chip (graphic display abbreviation) is accommodated on two or more biosensors 3, and it may constitute so that an amendment chip may be taken out first. Here, when the analysis apparatus 2 has memorized the data about two or more analytical curves, an amendment chip is used, for example in order to choose the analytical curve which suits the sensitivity of the biosensor 2 most from these analytical curves. Therefore, if an amendment chip is first taken out when using the sensor cartridge 1, a possibility of neglecting selection of the analytical curve using an amendment chip will be reduced. If an analytical curve is chosen using an amendment chip, the burden of the user who it becomes unnecessary to perform troublesome operation (for example, a user needs to perform button grabbing to the analysis apparatus 2 in selection of an analytical curve), and is in charge of selection of an analytical curve can be reduced.

[0028]It is preferred to use what has a dehumidifying function as the mounting base 49. Then, it can be controlled even if it is a case where the biosensor 3 deteriorates easily with humidity. The thing which was powdered to plates, such as what kneaded thermoplastics and the powder of driers, such as silica, and fabricated it as such a mounting base 49, for example, resin, and metal, and made the drier adhere to them for example, or the thing which fixed the drier to the inside of a porous body is used. When not giving a dehumidifying function to the mounting base 49, it is preferred to hold a drier in the receiving space 43.

[0029]The spring 48 is unified to the 1st member 41 while being constituted, for example as a flat spring. The spring 48 is unified to the 1st member 41 by carrying out insert molding of the flat spring which integral moulding of this 1st member 41 was carried out, or was formed as a separate member in the case of shaping of the 1st member 41, when fabricating the 1st member 41. However, it is preferred to carry out one shaping of the spring 48 with the 1st

member 41 from a viewpoint of workability and a manufacturing cost. Of course, it can replace with a flat spring and elastic bodies, such as a coil spring, fizz resin, and rubber, can also be used.

[0030]The biosensor 3 has the composition which attached the covering 32 via the spacer 31 on the substrate 30 as it appears in drawing 3 and drawing 4 well. The channel 33 is formed between the substrate 30 and the covering 32 at this biosensor 3. This channel 33 is open for free passage with the exterior via the sample feed port 33a and the air extraction mouth 33b. The two crevices 34 and 35 which extend crosswise [of the substrate 30] are further established in the biosensor 3. The crevice 34 is used when moving the biosensor 3 with the operation belt 5 later mentioned with reference to drawing 5. On the other hand, the crevice 35 is used, when equipping the analysis apparatus 2 with the biosensor 3 so that it may mention later with reference to drawing 7 (c) and (d). Although the both sides of the spacer 31 and the covering 32 are penetrated, it is not necessarily necessary to form the crevices 34 and 35 so that those both sides may be penetrated.

[0031]The working pole 36, the counter electrode 37, the electrode 38 (hereafter, these may be named generically and it may be called "the electrodes 36-38") for detection of a couple, and the reagent layer 39 are formed in the upper surface 30a of the substrate 30.

[0032]The working pole 36 and the counter electrode 37 are used when constant potential is given, for example to the reagent layer 39, and measuring the quantity of the electron supplied from the reagent layer 39 as response current. On the other hand, the electrode 38 for detection of a couple is used in order to judge whether blood was introduced in the channel 33 of the biosensor 3. The end parts 36a, 37a, and 38a of the electrodes 36-38 were covered with neither the spacer 31 nor the covering 32, but are exposed to it. These end parts 36a, 37a, and 38a constitute the terminal area for making the terminal 25 (refer to drawing 6 and drawing 7) of the analysis apparatus 2 mentioned later contact.

[0033]The reagent layer 39 is a solid state, for example, and as it covers the electrodes 36-38 to a series, it is formed. This reagent layer 39 distributes a little redox enzyme relatively to a lot of mediators (electron carrier), for example. As an electron transport substance, iron and the complex of Ru are used, for example. Redox enzyme is chosen by the kind of specific component which is the target of density measurement. As a specific component, glucose, cholesterol, and lactic acid are mentioned, for example. To such a specific component, the glucose dehydrogenase, glucose oxidase, cholesterol dehydrogenase, cholesterol oxidase, lactate dehydrogenase, and lactic acid oxidase are mentioned as redox enzyme.

[0034]The operation belt 5 has a looped shape gestalt as a whole, as shown in drawing 1, drawing 2, and drawing 5, and as there is along the outside surface of the annular wall 45 of the 1st member 41, it is spread around it. The operation belt 5 has the knob 50, the locking claw 51 of a couple, the occlusion part 52, and the opening 53.

[0035]The knob 50 is for carrying out relative displacement (rotational motion) of the operation belt 5 to this annular wall 45 and by extension, case 4 along the outside surface of the annular wall 45.

[0036]The locking claw 51 of a couple is for stopping the end which is inserted in the slit 45a of the upper wall part 45A in the annular wall 45, and projects via this slit 45a to the crevice 34 of the biosensor 3. The locking claw 51 of a couple is ******(ed) to the upper wall part 45A, while moving by operating the knob 50 in the inside of the slit 45a. Since the locking claw 51 is stopped in the crevice 34 at this time, you are made for the biosensor 3 to also ****** to the annular wall 45 and by extension, the case 4 by operation of the knob 50. The number or shape of the locking claw 51 are not limited to the illustrated example, but a design variation is possible for them.

[0037]The occlusion part 52 blockades the notch 46 of the annular wall 45 in a waiting state (state which does not take out the biosensor 3). It is controlled that the airtightness in the receiving space 43 of the case 4 in a waiting state is secured, and the biosensor 3 deteriorates with moisture by this, or between the electrodes 36-38 of the biosensor 3 short-circuits with dust etc.

[0038]The opening 53 is for opening the notch 46 of the annular wall 45, when the operation belt 5 is made to ****** to the annular wall 45 (i.e., when moving the biosensor 3). Thereby, the biosensor 3 held in the receiving space 43 can be discharged now outside from the receiving space 43. In the opening 53, the stopper part 45b of the case 4 is located, and when the edge and the stopper part 45b which specify the opening 53 by movement of the operation belt 5 interfere, movement of the operation belt 5 is restricted.

[0039]In the sensor cartridge 1 which has the above composition, as the waiting state was shown in drawing 5 (a), while the locking claw 51 of the operation belt 5 is engaging with the crevice 34 of the biosensor 3 located in the topmost part, the biosensor 3 is energized towards the upper part side. Thereby, only the biosensor 3 located in the topmost part is made relatively movable by movement of the operation belt 5 to the case 4. On the other hand, the notch 46 of the case 4 is blockaded by the occlusion part 52 of the operation belt 5. Thereby, the airtightness in the case 4 in a waiting state is secured.

[0040]If the knob 50 is operated and this knob 50 is moved in the direction of arrow B in a figure as shown in drawing 5 (b), the locking claw 51 and the occlusion part 52 will move in the direction of arrow B with the knob 50. ****** (rotational motion) is carried out along the outside surface of the annular wall 45, the operation belt 5 being guided by two or more projections 47 of the case 4 at this time. And if rotational motion of the operation belt 5 is carried out, while the occlusion part 52 will separate from the notch 46, the opening 53 of the operation belt 5 is located in the portion of the notch 46, and opens the receiving space 43 and the exterior for free passage. On the other hand, since the locking claw 51 is engaging with the crevice 34 of

the biosensor 3, when the locking claw 51 moves in the direction of arrow B, the biosensor 3 also moves in the direction of arrow B. Since the notch 46 has opened wide by movement of the knob 50 while the biosensor 3 is energized at the upper part side, only the one biosensor 3 is discharged from the notch 46. At this time, two or more whole biosensors 3 move to the upper part side from the biosensor 3 in the case 4 being energized up.

[0041]And when the biosensor 3 is thoroughly discharged from the case 4, the knob 50 is moved in the direction of arrow A that it should consider as the waiting state shown in drawing 5 (a). Then, the locking claw 51 of the operation belt 5 is stopped in the crevice 34 of the biosensor 3 located in the topmost part, and it is considered as a waiting state.

[0042]As shown in drawing 1 and drawing 6, the analysis apparatus 2 is constituted so that the concentration of the specific component in the sample solution supplied, for example to the biosensor 3 may be measured with an electrochemical technique. This analysis apparatus 2 is provided with the insert portion 21 for inserting the biosensor 3 for the sensor cartridge 1 with the attaching part 20 in which a positioning fix is possible, in addition has the display 22 and the manual operation button 23.

[0043]The attaching part 20 is a portion with which the notches 42A and 44A in the sensor cartridge 1 engage, and consists of the crevices 24 and 25 of a couple. These crevices 24 and 25 have the tapered surfaces 24a and 25a and the guide surfaces 24b and 25b. The distance between the guide surfaces 24b and 25b in each crevices 24 and 25, While the distance between the plate-like part 44 of the 1st member 41 and the 2nd member 42 in the case 4 is supported, the inclining state of the tapered surfaces 24a and 25a of the crevices 24 and 25 is equivalent to the inclining state of tapered surface 42Ab of the notches 42A and 44A of the case 4, and 44Ab. Therefore, in equipping with the sensor cartridge 1 to the analysis apparatus 2, the notches 42A and 44A of the sensor cartridge 1 and the crevices 24 and 25 of the attaching part 20 fit in. While movement of the thickness direction of the analysis apparatus 2 is restricted by the notches 42A and 44A at this time, movement of the thickness direction of the sensor cartridge 1 is restricted by the guide surfaces 24b and 25b of the crevices 24 and 25. As a result, the sensor cartridge 1 is fixed in the state where it was positioned to the analysis apparatus 2.

[0044]The insert portion 21 is formed between the crevices 24 and 25 of the attaching part 20, and has the holding space 26 in which the end part of the biosensor 3 can be accommodated. The heights 27a which project caudad are formed in the upper wall side 27 which specifies this holding space 26. These heights 27a fit into the crevice 35 of the biosensor 3, when the biosensor 3 is inserted into the holding space 26, as shown in drawing 7 (c) and (d). Thereby, the state where it equipped with the biosensor 3 to the analysis apparatus 2 is maintained. In the holding space 26, further two or more terminals 28 (only the one terminal 28 is expressed on the drawing) have extended. Two or more four terminals 28 are arranged, for example to

the part corresponding to the end parts 36a-38a of the electrodes 36-38 of the biosensor 3. Each terminal 28 is energized towards the lower part side. Therefore, when the biosensor 3 is inserted into the holding space 26, the substrate 30 of the biosensor 3 is pinched between the low wall sides 29 which specify the terminal 28 and the holding space 26. At this time, two or more terminals 28 contact the end parts 36a-38a of the electrodes 36-38.

[0045]To such an analysis apparatus 2, it is equipped with the biosensor 3 by the operation which is explained below using the sensor cartridge 1.

[0046]First, as shown in drawing 7 (a), the positioning fix of the sensor cartridge 1 is carried out to the analysis apparatus 2. Such a positioning fix is performed to the attaching part 20 of the analysis apparatus 2 by making the notches 42A and 44A of the sensor cartridge 1 fit in, as mentioned above. At this time, alignment also of the notch 46 of the sensor cartridge 1 (case 4) and the insert portion 21 of the analysis apparatus 2 is carried out.

[0047]Subsequently, if the biosensor 3 is discharged from the sensor cartridge 1 according to the procedure explained with reference to drawing 5, it will be equipped with the biosensor 3 to the analysis apparatus 2. If the knob 50 of the sensor cartridge 1 is moved in the direction of arrow B, for example by a user's manual operation, the biosensor 3 moves in the direction of arrow B, and, more specifically, the biosensor 3 is discharged from the sensor cartridge 1 (refer to drawing 5). At this time, as shown in drawing 7 (b), it is inserted in the insert portion 21 of the analysis apparatus 3 from the end 30b of the biosensor 3. While the end 30a of the substrate 30 will be pinched between the terminal 28 and the low wall side 29 as shown in drawing 7 (c) if it is made to move in the direction of arrow B of the biosensor 3 furthermore, the heights 27a engage with the crevice 35 of the biosensor 3. Thus, in the state where the biosensor 3 was fixed to the analysis apparatus 2, if the sensor cartridge 1 is made to desert the analysis apparatus 2 in the direction of arrow A as shown in drawing 7 (d), it will be equipped with the biosensor 3 to the analysis apparatus 2.

[0048]On the other hand, density measurement in the analysis apparatus 2 is performed by supplying a sample solution via the sample feed port 33a to (drawing 3 and refer to drawing 4), and the biosensor 3. The introduced sample solution runs the inside of the channel 33 towards the air vent port 33b from the sample feed port 33a. At this time, the reagent layer 39 and the specific component in a sample solution react, and a mediator returns or oxidizes. And if voltage is impressed to the reagent layer 39 via the end parts 36a and 37a, electronic transfer will be performed between the working pole 36 and a mediator. In the analysis apparatus 3, this amount of electron transfer is measured using the working pole 36 and the counter electrode 37. Since this amount of electron transfer is what is correlated with the concentration of a specific component, it can calculate the concentration of a specific component by measuring the amount of electron transfer. On the other hand, in the electrode 38 for detection, it is also detectable by measuring the amount of electron transfer to these

electrodes that the sample solution was supplied to the biosensor 2.

[0049]According to this embodiment, the positioning fix of the sensor cartridge 1 can be carried out to the analysis apparatus 2, and it can equip with the biosensor 3 to the analysis apparatus 2 only by moving the knob 50. The operation to which it can carry out simply using the notches 42A and 44A of the sensor cartridge 1 and the crevices 24 and 25 of the analysis apparatus 2, and the knob 50 is moved is also very easy for the positioning fix of the sensor cartridge 1 to the analysis apparatus 2. Thus, in this embodiment, since it can equip with the biosensor 3 to the analysis apparatus 2 by very simple operation, even if it is people and the senior in whom eyesight declined, it can equip with the biosensor 3 without fault.

[0050]The invention in this application is not limited to this embodiment mentioned above, but various design variations are possible for it. For example, about the sensor cartridge 1, as shown in drawing 8, it may replace with a looped shape operation belt, and band-like operation belt 5' may be used, and the member to which the biosensor 3 is moved as shown in drawing 9, and the member which opens and closes the notch 46 of the case 4 may be formed as a different body.

[0051]In the example shown in drawing 8, operation belt 5' has the same composition for the operation belt 5 previously explained except for the point currently formed in band-like, and as this operation belt 5' covers the upper wall part 45A of the annular wall 45, and the notch 46, it is provided. The both ends of operation belt 5' are being fixed to the annular wall 45 of the case 4 via the coil spring B1 and B-2. In the natural state, while the notch 46 is closed by occlusion part 52', locking claw 51' is stopped in the crevice 34 of the biosensor 3. When operating-knob 50' is moved in the direction of arrow B in a figure by a user's manual operation etc., while the biosensor 3 moves in the direction of arrow B, opening 53' is located in the part corresponding to the notch 46, and the notch 46 is opened wide. Thereby, the biosensor 3 is discharged from the notch 46. And if the power of acting on knob 50' is released, operation belt 5' will return to a natural state automatically according to spring force.

[0052]On the other hand, in the example shown in drawing 9, 5 " of operation bodies by which integral moulding was carried out are being fixed to the annular wall 45 of the case 4 for knob 50" and locking claw 51" via the spring B1. The notch 46 of the case 4 is blockaded by curtain 52". And the biosensor 3 is extruded by the exterior of the case 4, pushing away curtain 52", if 5 " of operation bodies are moved. If the power of acting on 5 " of operation bodies is canceled, 5 " of operation bodies will return to the position of a basis automatically according to the elastic force of the spring B1.

[0053]Also about the technique to which the biosensor 3 is moved by movement of the knob 50, as illustrated, for example to drawing 10, a design variation is possible. The example to which the biosensor 3 is moved when heights 34' is provided in drawing 10 (a) at the biosensor 3 and the locking claw 51 pushes heights 34', It was stopped by the air extraction mouth 33b

by which the example to which the biosensor 3 is moved was provided in the locking claw 51 by drawing 10 (c) at the biosensor 3, and when the locking claw 51 pushes the back end of the biosensor 3 showed the example to which the biosensor 3 is moved in this state to drawing 10 (b), respectively.

[0054]many things are boiled also about a means to carry out the positioning fix of the sensor cartridge to an analysis apparatus, or to fix a biosensor to an analysis apparatus on the other hand, and a design variation is possible. For example, while establishing a crevice in the insert portion of an analysis apparatus, the heights which engage with the above-mentioned crevice may be provided in a biosensor.

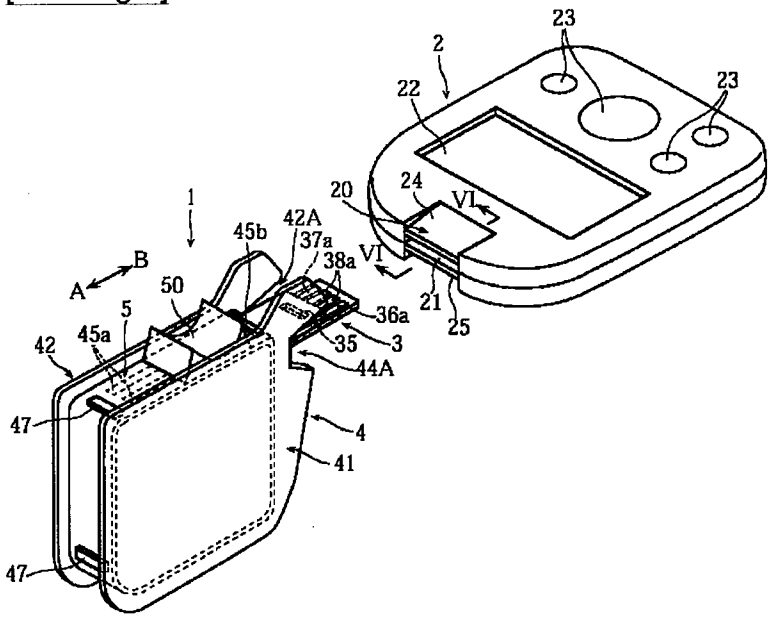
[Translation done.]

* NOTICES *

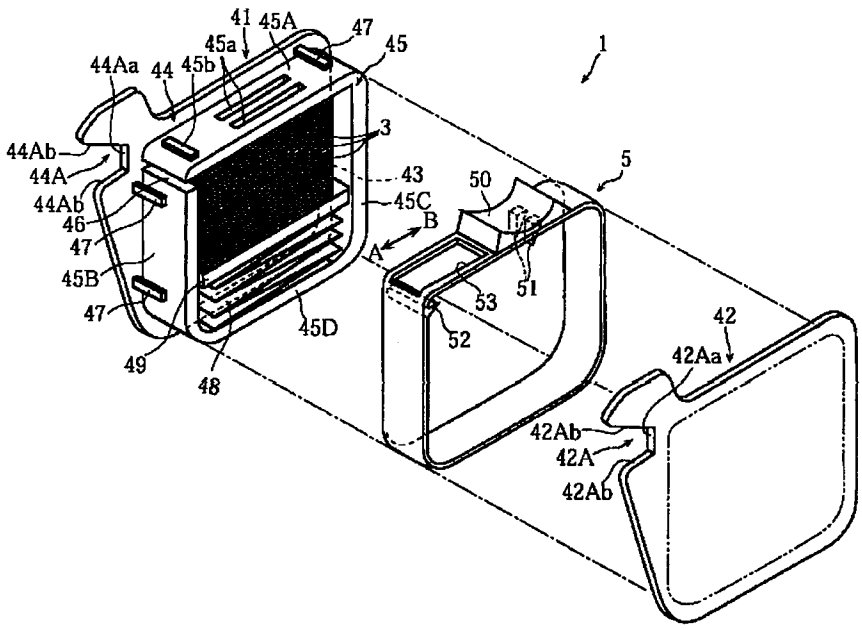
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

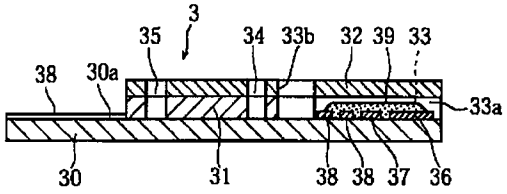
[Drawing 1]



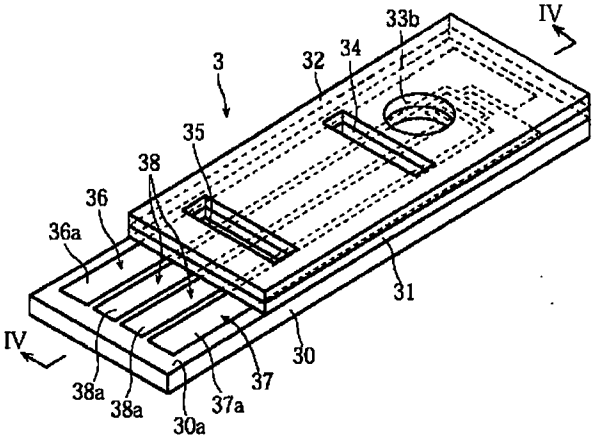
[Drawing 2]



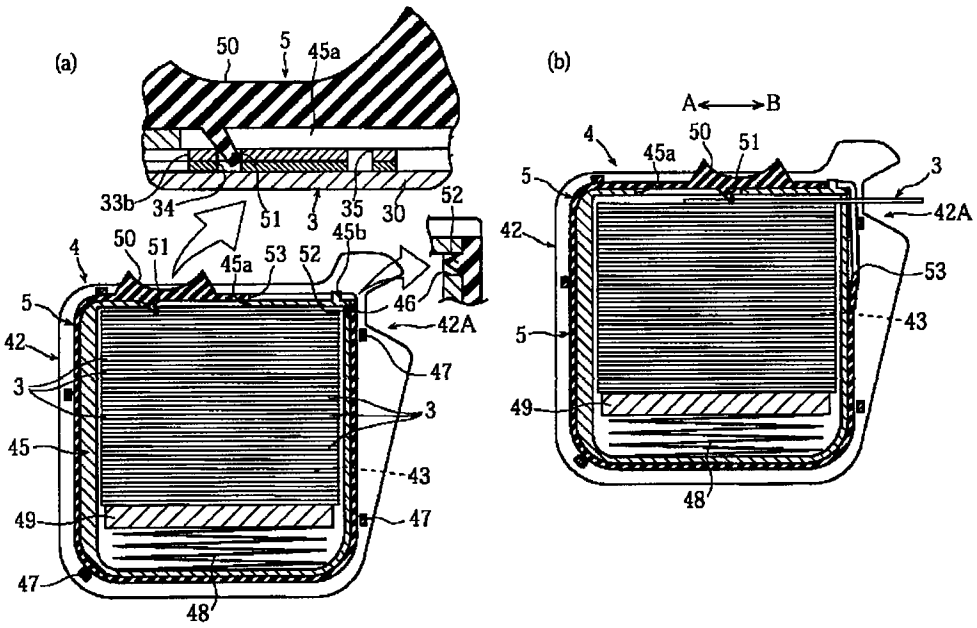
[Drawing 4]



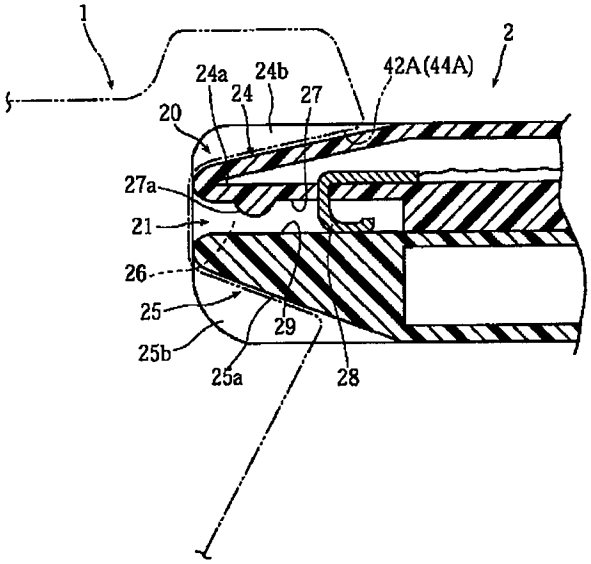
[Drawing 3]



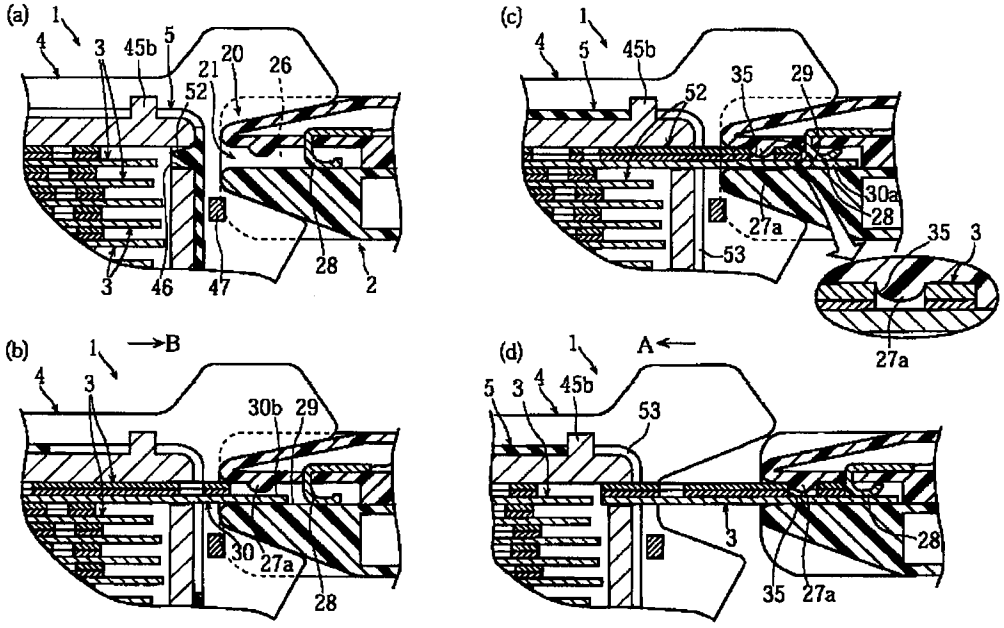
[Drawing 5]



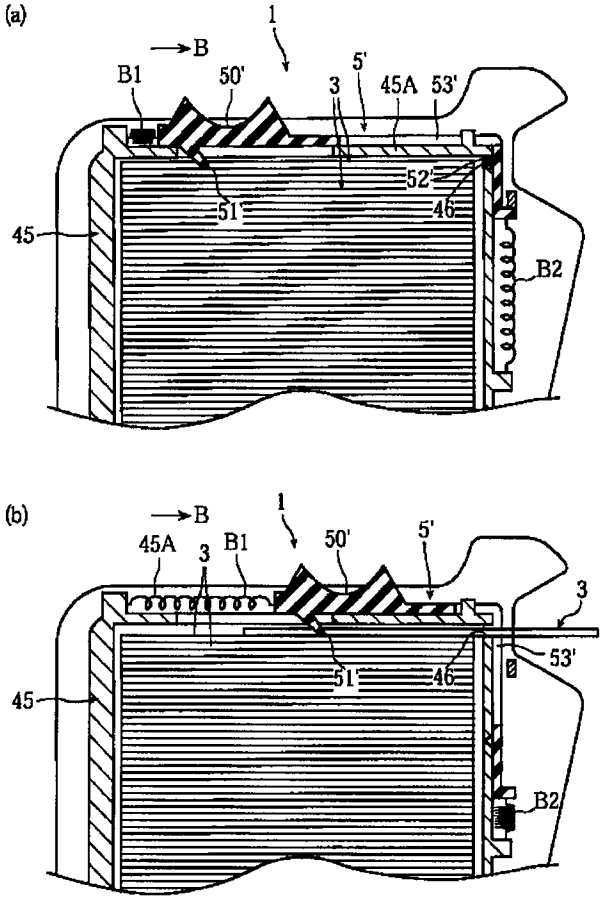
[Drawing 6]



[Drawing 7]

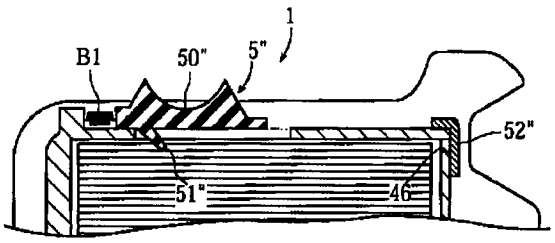


[Drawing 8]

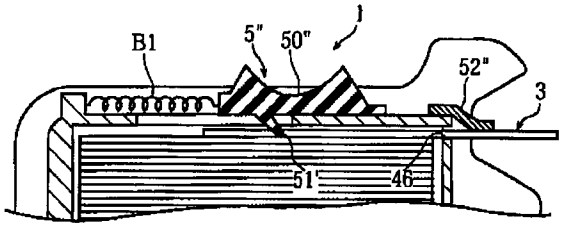


[Drawing 9]

(a)

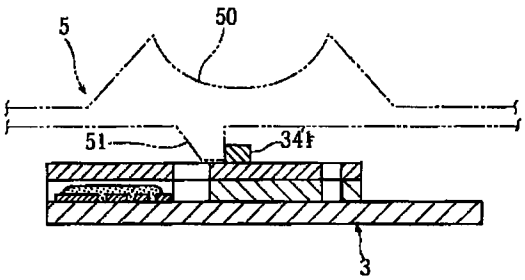


(b)

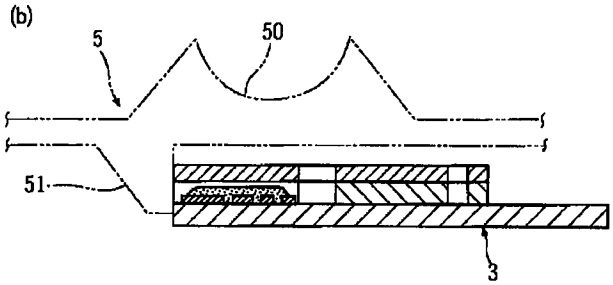


[Drawing 10]

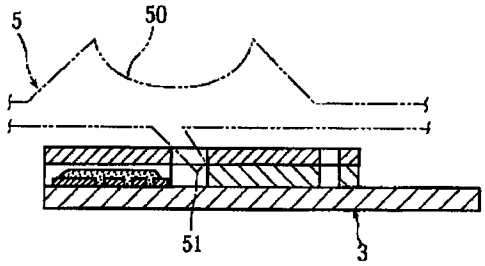
(a)



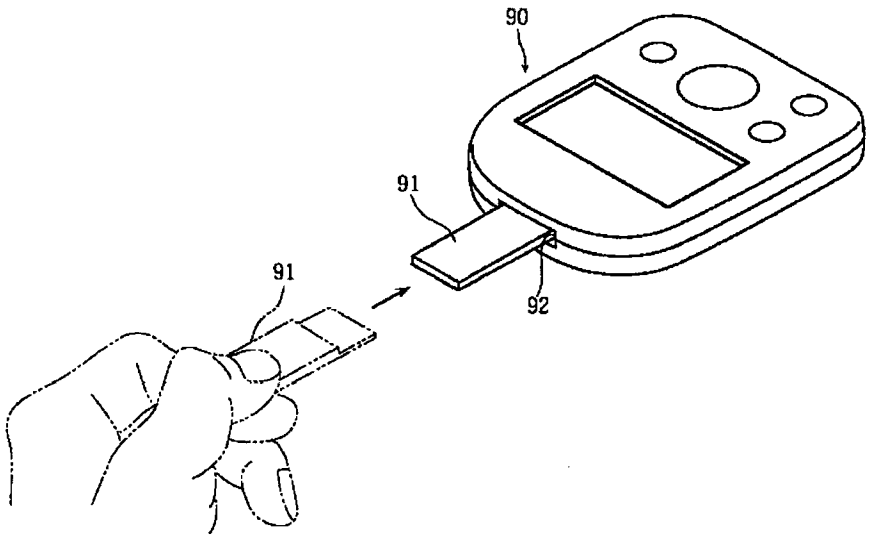
(b)



(c)



[Drawing 11]



[Translation done.]